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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 16

Application Number: 09/033,222
Filing Date: March 02, 1998
Appellant(s): HOGG ET AL.

MAILED

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GROUP 3600

Thomas Zell
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/25/02.

(1) ***Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

(2) ***Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) ***Status of Claims***

The statement of the status of the claims contained in the brief is correct.

(4) ***Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) ***Summary of Invention***

The summary of invention contained in the brief is correct.

(6) ***Issues***

The appellant's statement of the issues in the brief is correct.

(7) ***Grouping of Claims***

Appellant's statement that claims 1-20 stand or fall together is agreed with.

(8) ***Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) ***Prior Art of Record***

5,553,003	Harada et al	09-1996
6,119,052	Guenther et al	09-2000

6,039,316	Jackson et al	03-2000
6,027,112	Guenther et al	02-2000
5,634,636	Jackson et al	06-1997

Fujita et al, "A Conveyance System Using Air Flow Based on the Concept of Distributed Micro Motion Systems" IEEE Journal of Microelectromechanical Systems, Vol. 3, No. 2, June 1994, pp. 54-58.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-20 are rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 10.

(11) Response to Argument

Applicants assert that "Fujita" and Harada do not obviate Claims 1-20, as currently written. Fujita discloses the sensors, actuators and computational agent. Each of these components are shown in figure 1 of Fujita. Note that each "module" of Fujita explicitly illustrates the sensor and actuator. The logic circuit and communications circuit are construed as the computational agent. Figure 2 of Fujita illustrates a flat object moved by the conveyance system of Fujita, which comprises many of the smart modules of figure 1.

This directly correlates to Applicants' conveyance system as shown in Applicants' figures 1 and 2. Fujita, in the caption of figure 2, states that the conveyance system is "composed of many smart modules". In col. 1, lines 9-17, Fujita describes "when many microactuators are batch-fabricated in an array on a substrate, the coordination of their

simple motions will perform a more complicated task." Such a coordination is suggested to be performed by a hierarchical control scheme whereby a global controller directs local controllers, said local controllers directing the particular module.

Applicants cited "Controlling Agents in Smart Matter with Global Constraints" by Carlson, Gupta and Hogg in their IDS dated 6/2/98. Under "Control Principles", located on the second page of Carlson et al, 1st col., it is mentioned as follows.

> "In our design, the global controller produces an approximate specification of constraints based on simplifying assumptions of an idealized system (e.g., where all local devices are properly functional) and limited aggregate sensory information. This approximate specification is then delivered to the local agents who modify their behavior accordingly, but in light of the detailed information they have of their individual local environments."

Carlson et al further mentions in col. 2 of the same page, lines 9-11, that "further examples of using local interactions to achieve global constraints occur in …biology … and cellular automata."

It is clear from Carlson that global control of a system by higher level controllers that pass down global constraints to lower level subsystem controllers that take into account local conditions and reconcile these with the global constraints. Carlson further indicates that examples of such control are found in biology and cellular automata, which are fields outside of the relm of MEMS and nano devices.

Harada et al describes a distributed control system with several levels of supervising controllers. For example, see figure 1, which illustrates overall or global

supervising system (1), supervising subsystem (4) and lower subsystem (6b). The subsystem detects the condition of the subsystem (49) and reconciles the local knowledge (50) with the subgoal (48) defined by the supervising subsystem (1). Therefore, the control system exhibits the requirements for controlling the array of modules suggested by Fujita, as described above.

Although Harada et al describes a control system applied to a power generation environment, it is clear from col. 1, lines 5-25 and the "Summary of the Invention" that Harada also addresses the problem of distributed control, which can be applied to a wide variety of applications where global control of local controllers is required. Fujita suggests the problem and Harada et al readily solves that problem. Therefore, both Harada et al and Fujita are analogous art.

Applicants assert that local neighborhoods are not disclosed by Harada. However, electrical power grids necessarily have power generation systems whereby individual power generators are linked together in groups for powering local areas, the local area generators linked together so that excess power from one neighborhood can be sent to another neighborhood next to it or further away from it. Note figure 5, in which several generators are linked to each other by a bus (109). Note, for example, figure 14, which illustrates power generation stations (13). Note also col. 7, lines 15-17, where the generating station (13a) reports its fuel cost to the dispatch center. Note also col. 7, lines 21 and 22, which state that the "supervising goal" contains power flow restrictions of the transmission lines. Note lines 23-30, which indicate that the individual power generating station acts as a subsystem. Note also col. 7, lines 35 and 36, which

states that the power generating station (13a and 13b) can function as a dispatching center (11).

It appears that there is a dotted or dashed line linking both power generation stations. Such a dashed line in a control system is well-known in the art to indicate communication between both objects. It is also well-known that local power generation stations in the U.S. are connected to a major power grid. In such a grid, power systems or groups of them communicate with each other to share excess power between them. In that way, California was able to obtain extra power from power stations across the country to alleviate a shortage there. Note also that it can be considered obvious to use several hierarchies of control dispatching centers. The reason for doing so would be to provide a more particular adaptation to local needs while compensating for global requirements.

Such a global requirement for the transport system of Fujita might be "move the sheet five inches down the transport path". In order to perform such an overall requirement with the modules of Fujita, it would be expected that they would have to be coordinated in an organized manner. In other words, the system illustrated in figure 14 could be construed to be a neighborhood, which in turn can be construed to be part of a larger neighborhood of such systems also controlled by an overall global controller. This might, for example represent power generation stations in a particular community, as part of the national power grid, or local modules or groups of modules of Fujita. Groupings would appear to even be considered a matter of design choice by those of ordinary skill in the art, since the number of modules controlled by a subcontroller

depends upon the accuracy of control required versus the output of each individual actuator.

Several community level systems would be linked by a global controller. Several global level systems might be linked by a yet higher level global controller. Note also figure 11, which has a dashed line between generators (78a and 78b) and a dashed line between power generating system (77a and 77b). It is clear from Fujita, that modules communicate with other entities. Harada discloses hierarchical control whereby such subsystems execute their portion of a larger goal (51) based on local knowledge (50). Such a subsystem can be construed to include one module or several modules. Those ordinarily skilled in the art would consider this to be instructive as to how to create a control scheme for the modules of Fujita. Note again also the suggestions of biological systems. The modules of Fujita necessarily compute local conditions.

Harada discloses global control goals and passing down of these goals to the modules. Note also that the claim language does not appear to define exactly how many local modules constitute a neighborhood. Therefore, it appears that either one or several modules may constitute a neighborhood. Either way, Harada discloses hierarchical control on one or several levels. It appears that Applicants' claims, reasonably broadly construed, are met by the suggested combination of Harada and Fujita.

Regarding the obviousness double patenting rejection in view of the '636 patent, it appears that this still applies for the same reasons as described above, if not in view of the '636 patent by itself, then in combination with Harada.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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February 24, 2003

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